

**DATA EVALUATION RECORD
VEGETATIVE VIGOR EC₂₅ TEST
§123-1 (TIER II)**

1. **CHEMICAL**: Isoxaflutole

PC Code No.: 123000

2. **TEST MATERIAL**: RPA 202248 (Isoxaflutole degradate)

Purity: 99.9%

3. **CITATION**:

Author: Teixeira, D.

Title: RPA 202248- Determination of Effects on Vegetative
Vigor Screening of Three Plant Species Sprayed at Low
Volume

Study Completion Date: May 15, 2000

Laboratory: Springborn Laboratories, Inc.
790 Main Street
Wareham, Massachusetts

Sponsor: Rhone-Poulenc Ag Company
2 T.W. Alexander Drive
Research Triangle Park, North Carolina

Laboratory Report ID/Study ID: 98-6-7376/10566.0498.6491.610

MRID No.: 45535401

DP Barcode: D282361

4. **REVIEWED BY**: Rebecca Bryan, Staff Scientist, Dynamac Corporation

Signature:

Date: 8/28/02

APPROVED BY: Teri Myers, Ph.D., Staff Scientist, Dynamac Corporation

Signature:

Date: 8/28/02

5. **APPROVED BY**: Mike Davy, OPP/EFED/ERB II

Signature:

Date:

*Printed from
Contractor Drafts*



6. STUDY PARAMETERS:

Scientific Name of Test Organism: Dicots: *Brassica oleracea*, *Lactuca sativa*, and *Brassica rapa*
Monocots: None.

Definitive Study Duration: 21 days

Type of Concentrations: Nominal

7. CONCLUSIONS:

The vegetative vigor of three plant species was tested in a screening study after application of RPA 202248 (the primary degradate of parent compound RPA 201772) applied at low water volume (13 gallons per acre) at three low-dose concentrations. Test species (all dicots) included cabbage, lettuce, and turnip. Cabbage was tested at rates of 0.000095, 0.00019, and 0.00038 lb a.i./A; lettuce was tested at rates of 0.00012, 0.00023, and 0.00046 lb a.i./A; turnip was tested at rates of 0.000075, 0.00015, and 0.00030 lb a.i./A.

Cabbage was the most sensitive species based on whole plant weight. The EC₂₅ for cabbage whole plant weight was 0.00011 lb a.i./A and the NOEC was <0.000095 lb a.i./A., because significant effects were detected at all treatment levels.

This study is classified as Supplemental. It is scientifically sound but because it was conducted as a preliminary screening study, it does not fulfill the US EPA guideline requirements for a vegetative vigor study (Subdivision J, §123-1, TIER II). Significant reductions (>25%) were shown for all three species and most endpoints, which justifies conducting a definitive Tier II study with RPA 202248 that satisfies the US EPA guideline requirements for a vegetative vigor test.

Most sensitive monocot: N/A

Most sensitive dicot: **Cabbage**

Most sensitive parameter: Whole plant weight

EC₂₅: 0.00011 lb a.i./A 95%CI: 0.0000495-0.00024 lb a.i./A

NOEC: <0.000095 lb a.i./A Probit slope: 1.38 ± 0.408

8. ADEQUACY OF THE STUDY:

A. Classification: Supplemental

B Rationale: This study is scientifically sound but, because it was conducted as a

preliminary screening test, it does not fulfill the guideline requirements for a vegetative vigor study (Subdivision J, §123-1, TIER II).

C. Repairability: The results from this screening study justify conducting a definitive Tier II study with RPA 202248 that satisfies the US EPA guideline requirements for a vegetative vigor test. Another screening test (at high water volume) was submitted for RPA 202248 which also showed significant reductions (>25%) for these three species (MRID 45535405). The study author reported that this test was conducted at the request of the study sponsor subsequent to the submission of a study exposing 10 plant species to the parent compound RPA 201772 (SLI report # 94-4-5234); however, SLI report # 94-4-5234 (MRID 45535403) contains only data with no description of the experimental procedure.

9. GUIDELINE DEVIATIONS:

The study author did not calculate EC₂₅ or NOEC values. Reductions for most endpoints of all species (cabbage, weight; lettuce and turnip, length and weight) exceeded 25% of the pooled control values.

Because this study was conducted as a screening study, there were numerous deviations from the US EPA guidelines for a vegetative vigor test (e.g., number of species tested, number of dose levels, replicate number, etc.).

10. SUBMISSION PURPOSE: This screening study was submitted to provide supplemental data on the toxicity of RPA 202248 applied at low water volume (13 gallons per acre) to the vegetative vigor of several plant species for the purpose of chemical registration. The study author reported that this test was conducted at the request of the study sponsor subsequent to the submission of a study exposing 10 plant species to the parent compound RPA 201772 (SLI report # 94-4-5234).

11. MATERIALS AND METHODS:**A. Test Organisms**

Guideline Criteria	Reported Information
Species: 6 dicots in 4 families, including soybean and a rootcrop; 4 monocots in 2 families, including corn.	<u>Dicots</u> : cabbage, lettuce, and turnip <u>Monocots</u> : None
Number of plants per repetition:	5 seedlings per replicate; ten total seedlings per test concentration
Source of seed and historical % germination of seed:	Park Seed Company, Greenwood, South Carolina; 93-96% seed germination (Table 1, p. 17).

B. Test System

Guideline Criteria	Reported Information
Solvent:	10% acetone:90% deionized water mixture
Site of test:	Tests were performed at Springborn Laboratories Inc., Wareham, Massachusetts in an environmental chamber.
Planting method/type of pot:	<p>The planting pots were polypropylene (top diameter = 13 cm, bottom diameter = 9 cm, height = 13 cm, depth of soil = 10 cm). This information was obtained from the protocol included in report (p. 32).</p> <p>The soil substrate was a sandy-loam (lot# 397C) purchased from Read Sand and Gravel Co., Rockland, Massachusetts. Silica sand (20- to 40-mesh; 0.11% organic matter, pH 7.3) from Wedron Silica Co. was added to the sandy loam 3:1 (sandy loam:sand) by weight. The organic matter of the soil was analyzed at Springborn Laboratories and the results indicated 2.0%</p>

Guideline Criteria	Reported Information
	organic matter. No pesticides, PCBs, or toxic metals were found in analysis of the sandy-loam or silica sand samples (Appendix III, pp. 42-48).
Method of application:	Foliage application using overhead atomizing spray nozzle (Spray Systems Company, Wheaton, Illinois) and revolving belt which moved plants past the spray nozzle. The system was calibrated to deliver 0.13 mL of treatment solution per pot (low water volume).
Method of watering:	Subirrigation via a polypropylene saucer.
Growth stage at application:	Seedling (0.9-1.0 mean true leaves) (p.68)

C. Test Design

Guideline Criteria	Reported Information
Dose range: 2x or 3x	2x
Doses: At least 5	<u>cabbage</u> : 0.000095, 0.00019, and 0.00038 lb a.i./A. <u>lettuce</u> : 0.00012, 0.00023, and 0.00046 lb a.i./A. <u>turnip</u> : 0.000075, 0.00015, and 0.00030 lb a.i./A.
Controls: Negative and solvent	Negative and solvent control
Replicates per dose: At least 3	2 replicates per dose
Test duration: 14 days	21 days (7 day preincubation and 14 days after application)
Were observations made at least weekly?	Weekly observations
Maximum dosage rate:	All doses tested were low-dose applications.

DP Barcode: D282361

MRID No.: 45535401

Guideline Criteria	Reported Information
	The maximum dosage tested was 0.00046 lb a.i./A (lettuce).

12. REPORTED RESULTS:

Guideline Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	Yes
Was a NOEC observed for each species?	No, a NOEC could not be determined for cabbage and lettuce weight because significant reductions (>25%) were detected at all treatment levels, compared to the pooled control.
Phytotoxic observations:	Chlorosis, necrosis, and phototoxicity indices were calculated (formula and rating system on p. 12). Plant length and dry weight were also measured at test termination. The shoot and root portions of the plants were dried in radiant heat ovens at 106 to 107°C for ≥3 days to obtain the whole plant dry weights.
Were initial chemical concentrations measured? (Optional)	Not reported
Were adequate raw data included?	Yes

Results for the most sensitive parameter of each species**Results Synopsis**

Crop	Shoot length		Whole plant weight		Most sensitive parameter
	NOEC	EC ₂₅	NOEC	EC ₂₅	
Cabbage	Not reported	Not reported	Not reported	Not reported	Not reported
Lettuce	Not reported	Not reported	Not reported	Not reported	Not reported
Turnip	Not reported	Not reported	Not reported	Not reported	Not reported

Morphological Observations

Cabbage: Mean shoot lengths slightly decreased with increasing test concentrations, compared to the pooled controls. The % inhibition compared to the pooled control was 0.0, 8.1, and 5.4% for the 0.000095, 0.00019, and 0.00038 lb a.i./A treatment groups, respectively.

Mean whole plant weights decreased with increasing test concentrations, compared to the pooled control. The % inhibition compared to the pooled control was 17, 44, and 50% for the 0.000095, 0.00019, and 0.00038 lb a.i./A treatment groups, respectively.

By 21 days, chlorosis was observed in the 0.000095, 0.00019, and 0.00038 lb a.i./A treatment groups. The severity of chlorosis increased with increasing test concentrations and was significant in the highest treatment group, 0.00038 lb a.i./A.

There were two mortalities in the 0.00019 lb a.i./A treatment group. No other mortalities were observed.

Lettuce: Mean shoot lengths decreased with increasing test concentrations, compared to the pooled control. The % inhibition compared to the pooled control was 3.9, 31, and 39% for the 0.00012, 0.00023, and 0.00046 lb a.i./A treatment groups, respectively.

Mean whole plant weights decreased with increasing test concentrations, compared to the pooled control. The % inhibition compared to the pooled control was 30, 38, and 43% for the 0.00012, 0.00023, and 0.00046 lb a.i./A treatment groups, respectively.

By 21 days, necrotic, chlorotic, and phototoxic effects were observed in the 0.00023 and 0.00046 lb a.i./A treatment groups. The severity of these effects increased with increasing test concentrations and necrotic and phototoxic effects were significant in the 0.00023 and 0.00046 lb a.i./A treatment groups.

There were two mortalities in the 0.00023 lb a.i./A treatment group. No other mortalities were observed.

Turnip: Mean shoot lengths decreased with increasing test concentrations, compared to the pooled control. The % inhibition compared to the pooled control was 18, 25, and 30% for the 0.000075, 0.00015, and 0.00030 lb a.i./A treatment groups, respectively.

Mean whole plant weights decreased with increasing test concentrations, compared to the pooled control. The % inhibition compared to the pooled control was 11, 23, and 36% for the 0.000075, 0.00015, and 0.00030 lb a.i./A treatment groups, respectively.

No morphological abnormalities or mortalities were observed.

Statistical Results

Statistical Method: No statistical analyses were reported by the study author and EC₂₅ and NOEC values were also not reported.

13. REVIEWER'S VERIFICATION OF STATISTICAL RESULTS:

Statistical Method: With the exception of lettuce length, length and weight data for all other species were shown to be normally distributed and the variances were homogeneous; data for lettuce length were normally distributed, but the variances were heterogeneous. The NOEC and LOEC values for lettuce length were determined using the Kruskal-wallis test, followed by Dunn's multiple comparison procedure. The NOEC and LOEC values for all other species and endpoints were determined using ANOVA, followed by William's test. These analyses were conducted using TOXSTAT statistical software. The EC₂₅ values were determined using the probit method via Nuthatch statistical software.

Results synopsis

Crop	Shoot length		Whole plant weight		Most sensitive parameter
	NOEC*	EC ₂₅ *	NOEC*	EC ₂₅ *	
Cabbage	0.00038	>0.00038	<0.000095	0.00011	Whole plant weight
Lettuce	0.00046	0.00024	<0.00012	<0.00012	Whole plant weight
Turnip	0.000075	0.00018	0.000075	0.00018	Shoot length and whole plant weight

* Units are lb a.i./A

Most sensitive monocot: N/A

Most sensitive dicot: Cabbage

Most sensitive parameter: Whole plant weight

EC₂₅: 0.00011 lb a.i./A 95%CI: 0.0000495-0.00024 lb a.i./A

NOEC: <0.000095 lb a.i./A Probit slope: 1.38 ± 0.408

14. REVIEWER'S COMMENTS:

The reviewer determined that cabbage was the most sensitive species, based on whole plant weight. The NOEC values were determined by the reviewer. The NOEC and EC₂₅ were not calculated by the study author.

The study author reported that this test was conducted at the request of the study sponsor subsequent to the submission of a study exposing 10 plant species to the parent compound RPA 201772 (SLI report # 94-4-5234; p. 8). The application rates selected for each species in this study ranged from 50% above the EC₅₀ value, at the EC₅₀ value, and 50% below the EC₅₀ values for root weight determined during a previous vegetative vigor exposure with RPA 201772 conducted at Springborn (SLI Report #94-4-5234). The cited study, SLI Report #94-4-5234, was apparently submitted to EPA as MRID 45535403; however, this report contains only data, with no description of the experimental procedure.

The solution concentration applied during the low volume vegetative vigor tests was determined as a function of the surface area of the treated pots and the volume of the treatment solution applied (sample calculation on p. 9). The solution concentration needed to provide 1 lb a.i./A was 8975 mg a.i./L for all species.

The following environmental conditions were reported in Table 2, p. 18: the mean relative humidity was 64% (range: 60-75%), the mean temperature was 25°C (range: 21-28°C), the mean light intensity was 12000 lux (range: 9800-14000), and the mean carbon dioxide was 420 ppm (range: 400-460 ppm).

This study was conducted in accordance with USEPA Good Laboratory Practice Standards and included a Quality Assurance statement.

15. REFERENCES: None cited

APPENDIX I. OUTPUT FROM REVIEWER'S STATISTICAL VERIFICATION:**Cabbage**

cabbage weight

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ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	3	0.0111	0.0037	18.500
Within (Error)	6	0.0010	0.0002	
Total	9	0.0121		

Critical F value = 4.76 (0.05,3,6)

Since $F > \text{Critical } F$ REJECT H_0 : All groups equal

cabbage weight

File: 5401cw Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 H_0 : Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	pooled control	0.156	0.156		
2	0.000095	0.130	0.130	2.137	
3	0.00019	0.088	0.088	5.562 *	
4	0.00038	0.077	0.077	6.436 *	

Bonferroni T table value = 2.75 (1 Tailed Value, $P=0.05$, $df=6,3$)

cabbage weight

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BONFERRONI T-TEST - TABLE 2 OF 2 H_0 : Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of DIFFERENCE CONTROL FROM CONTROL
1	pooled control	4		
2	0.000095	2	0.034	21.6
3	0.00019	2	0.034	21.6
4	0.00038	2	0.034	21.6

cabbage weight

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	ORIGINAL N	MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	pooled control	4	0.156	0.156	0.156
2	0.000095	2	0.130	0.130	0.130
3	0.00019	2	0.088	0.088	0.088
4	0.00038	2	0.077	0.077	0.077

cabbage weight

File: 5401cw Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. MEAN	SIG WILLIAMS	TABLE P=.05	DEGREES OF WILLIAMS	FREEDOM
pooled control	0.156					
0.000095	0.130	2.318	*	1.94	k= 1, v= 6	
0.00019	0.088	6.033	*	2.06	k= 2, v= 6	
0.00038	0.077	6.981	*	2.10	k= 3, v= 6	

s = 0.013

Note: df used for table values are approximate when v > 20.

Lettuce

lettuce length

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KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	pooled control	2.550	2.550	30.000
2	0.00012	2.500	2.500	15.000
3	0.00023	1.750	1.750	6.500
4	0.00046	1.550	1.550	3.500

Calculated H Value = 6.874

Critical H Value Table = 6.545

Since $\text{Calc } H > \text{Crit } H$ REJECT H_0 : All groups are equal.

lettuce length

File: 5401II Transform: NO TRANSFORMATION

DUNN'S MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2

GROUP				
TRANSFORMED ORIGINAL 0 0 0 0				
GROUP IDENTIFICATION	MEAN	MEAN	4 3 2 1	
4	0.00046	1.550	1.550 \	
3	0.00023	1.750	1.750 . \	
2	0.00012	2.500	2.500 .. \	
1 pooled control	2.550	2.550 ... \		

* = significant difference ($p=0.05$) . = no significant difference
 Table q value (0.05,4) = 2.639 Unequal reps - multiple SE values

lettuce weight

File: 5401IW Transform: NO TRANSFORMATION

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	3	1.584	0.528	9.778
Within (Error)	6	0.323	0.054	
Total	9	1.907		

Critical F value = 4.76 (0.05,3,6)

Since $F > \text{Critical } F$ REJECT H_0 : All groups equal

lettuce weight

File: 5401IW Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 H_0 : Control < Treatment

TRANSFORMED MEAN CALCULATED IN				
GROUP IDENTIFICATION	MEAN	ORIGINAL UNITS	T STAT	SIG
1 pooled control	2.135	2.135		

2	0.00012	1.495	1.495	3.180 *
3	0.00023	1.320	1.320	4.050 *
4	0.00046	1.215	1.215	4.572 *

Bonferroni T table value = 2.75 (1 Tailed Value, P=0.05, df=6,3)

lettuce weight

File: 5401lw Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of DIFFERENCE FROM CONTROL
1	pooled control	4		
2	0.00012	2	0.553	25.9 0.640
3	0.00023	2	0.553	25.9 0.815
4	0.00046	2	0.553	25.9 0.920

lettuce weight

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	ORIGINAL N	MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	pooled control	4	2.135	2.135	2.135
2	0.00012	2	1.495	1.495	1.495
3	0.00023	2	1.320	1.320	1.320
4	0.00046	2	1.215	1.215	1.215

lettuce weight

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WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. MEAN	SIG WILLIAMS	TABLE P=.05	DEGREES OF WILLIAMS FREEDOM
pooled control	2.135				
0.00012	1.495	3.186	*	1.94	k= 1, v= 6
0.00023	1.320	4.057	*	2.06	k= 2, v= 6
0.00046	1.215	4.580	*	2.10	k= 3, v= 6

s = 0.232

Note: df used for table values are approximate when $v > 20$.

Turnip

turnip length

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ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	3	2.866	0.955	3.730
Within (Error)	6	1.535	0.256	
Total	9	4.401		

Critical F value = 4.76 (0.05,3,6)

Since $F < \text{Critical F}$ FAIL TO REJECT H_0 : All groups equal

turnip length

File: 5401tl Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2 H_0 : Control < Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	pooled control	4.350	4.350		
2	0.000075	3.600	3.600	1.712	
3	0.00015	3.300	3.300	2.396	
4	0.00030	3.050	3.050	2.967 *	

Bonferroni T table value = 2.75 (1 Tailed Value, $P=0.05$, $df=6,3$)

turnip length

File: 5401tl Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 H_0 : Control < Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of DIFFERENCE CONTROL FROM CONTROL
1	pooled control	4		
2	0.000075	2	1.205	27.7 0.750
3	0.00015	2	1.205	27.7 1.050
4	0.00030	2	1.205	27.7 1.300

turnip length

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	ORIGINAL N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	pooled control	4	4.350	4.350	4.350
2	0.000075	2	3.600	3.600	3.600
3	0.00015	2	3.300	3.300	3.300
4	0.00030	2	3.050	3.050	3.050

turnip length

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WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. MEAN	SIG WILLIAMS	TABLE P=.05	DEGREES OF WILLIAMS	FREEDOM
pooled control	4.350					
0.000075	3.600	1.712		1.94	k= 1, v= 6	
0.00015	3.300	2.397	*	2.06	k= 2, v= 6	
0.00030	3.050	2.968	*	2.10	k= 3, v= 6	

s = 0.506

Note: df used for table values are approximate when v > 20.

turnip weight

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ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	3	0.0047	0.0016	4.000
Within (Error)	6	0.0021	0.0004	
Total	9	0.0068		

Critical F value = 4.76 (0.05,3,6)

Since F < Critical F FAIL TO REJECT Ho:All groups equal

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turnip weight

File: 5401tw Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 1 OF 2

Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	pooled control	0.155	0.155		
2	0.000075	0.138	0.138	0.981	
3	0.00015	0.120	0.120	2.026	
4	0.0003	0.099	0.099	3.250 *	

Bonferroni T table value = 2.75 (1 Tailed Value, P=0.05, df=6,3)

turnip weight

File: 5401tw Transform: NO TRANSFORMATION

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of DIFFERENCE CONTROL FROM CONTROL
1	pooled control	4		
2	0.000075	2	0.048	30.7 0.017
3	0.00015	2	0.048	30.7 0.035
4	0.0003	2	0.048	30.7 0.056

turnip weight

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WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	ORIGINAL N	MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	pooled control	4	0.155	0.155	0.155
2	0.000075	2	0.138	0.138	0.138
3	0.00015	2	0.120	0.120	0.120

4 0.0003 2 0.099 0.099 0.099

turnip weight

File: 5401tw Transform: NO TRANSFORMATION

WILLIAMS TEST (isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
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pooled control 0.155

0.000075	0.138	1.049		1.94	k= 1, v= 6
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0.00015	0.120	2.166	*	2.06	k= 2, v= 6
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0.0003	0.099	3.475	*	2.10	k= 3, v= 6
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s = 0.019

Note: df used for table values are approximate when v > 20.